

TREND STUDY 17-15-96 (old 21-10)

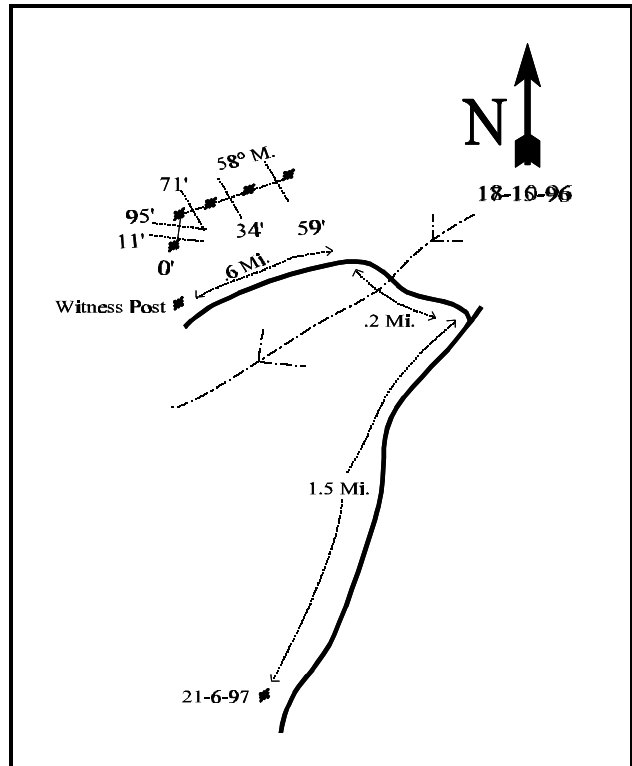
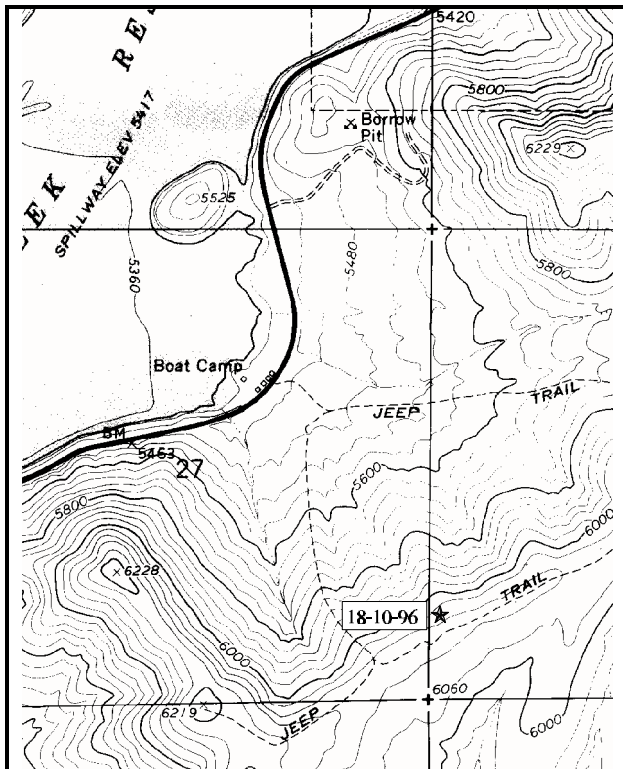
Study site name: Island Boat Camp. Range type: Bitterbrush.

Compass bearing: frequency baseline 1 degrees magnetic.

Footmark (first frame placement) 5 feet, footmarks (frequency belts) Line 1 (11 & 95ft), line 2 (71ft), line 3 (34ft), line 4 (59ft).

LOCATION DESCRIPTION

Beginning at the intersection of U.S. 189 and the Wallsburg turnoff, proceed .50 miles towards Wallsburg to an intersection. Turn left at the intersection and proceed northerly for just over 1 mile passing through two DWR gates to another intersection, and turn right. Proceed .05 miles to a small rock pile on the left(i.e., east) side of the road which marks study #17-11, Wallsburg Turn. Continue down the road traveling north passing a left fork for 1.5 miles to a fork. Bear left and go .2 miles thru a drainage to another ridge top and bear left. Drive along the ridge .6 miles to a witness post on the north side of the road.



Map Name: Charleston, Utah

Diagrammatic Sketch

Township 4S, Range 4E, Section 26, UTM COOR: 4-59-799E 44-76-301N

DISCUSSION

Trend Study No. 17-15 (21-10)

The Island Boat Camp study is located on a ridge overlooking both the Island Boat Camp and Wallsburg. It is representative of the unburned mixed mountain brush type that formerly was so prevalent on the better quality sites in the western part of the Wallsburg-Deer Creek Reservoir winter range. Virtually all of the winter range to the north, east, and south of this site was burned in 1976. The study begins on the ridge top and extends onto a gently sloping (3-5%) area with a northwest aspect. Elevation is approximately 6,000 feet. Big game use, as evidenced by levels of hedging on the principal browse and frequency of deer and elk pellet groups, is moderate. Cattle also use the area but not excessively.

Soils are derived from limestone with an effective rooting depth (see methods) of almost 18 inches. The average soil temperature at 18 inches was 50°F. Rocks were encountered throughout the soil profile, yet very little were observed on the soil surface. Textural analysis indicates a clay loam that is slightly alkaline (pH of 7.8). Soil erosion is minimal due to abundant vegetative and litter cover. Percent bare soil has remained nearly the same since 1989 at around 9%.

The browse component is productive and diverse. The most abundant species is the unutilized stickyleaf low rabbitbrush. It did not increase between 1983 and 1989, but has now increased to 6,000 plants/acre. Mountain big sagebrush provides just over 10% canopy cover. Density shows a slow decline since 1983 when it was estimated at 3,199 plants/acre and now is estimated at 2,080 plants/acre. A higher percentage of decadence (42%) was noted in 1989, but this has now declined to 26%. The majority of the mountain big sagebrush are moderately hedged and display excellent vigor. No plants were classified as a seedling in any of the years this area was sampled. Broom snakeweed was encountered in 1996, with an estimated density of 900 plants/acre. It was likely always present but not sampled with the much smaller sample size previously used. The antelope bitterbrush is a mature population with no seedlings or young classified in 1996. Percent decadence is lower than reported in 1989, but nearly all the plants exhibit heavy use. Estimated density is 600 plants/acre. The serviceberry population has remained fairly stable with an estimated density of 1,220 plants/acre in 1996. Percent decadence and utilization have declined since 1989, while vigor has improved. Other browse species include snowberry and gray horsebrush.

Sum of nested frequency for perennial grasses has increased since 1989 and nearly doubled since 1983. Bluebunch wheatgrass sum of nested frequency has significantly increased since 1989. Cheatgrass is not as abundant on this site as it was on some of the surrounding sites that were disturbed by fire in recent years. Other common species include muttongrass, Sandberg bluegrass, and Indian ricegrass.

Forb diversity is quite high with 38 species encountered. Sum of nested frequency for perennial forbs has increased from 520 in 1989 to 1,251 in 1996. The dominate perennial species include sulfur eriogonum, pale agoseris, longleaf phlox, and viola. Annual forbs include little flower Collinsia, pale alyssum, and Douglas knotweed.

1983 APPARENT TREND ASSESSMENT

Soil and vegetative trend are both stable. This is a highly productive site which, when compared to similar burned areas, gives one an appreciation of the loss resulting from the 1976 fire. A possible use for this study might be as a "comparison area" from which management objectives for the burned areas might be

derived.

1989 TREND ASSESSMENT

The soil trend is stable. Although big sagebrush shows a slight decline, other key indicators are stable to improving. There is ample browse forage available. The vegetative trend is stable. The data displays a diverse and stable site in the mixed mountain brush type on the DWR Wallsburg property. There is excellent production and diversity of forage. More sign of big game use was observed here than on any other study site around the Wallsburg area.

1996 TREND ASSESSMENT

Soil trend is stable with litter and bare soil cover values remaining nearly constant. Rock and pavement combined cover are declining from 1989 to values similar to those reported in 1983. The browse trend is also stable. Many of the plants exhibit better vigor than reported in 1989. Mountain big sagebrush density has slowly declined since 1983 and this trend should continue to be monitored in the future. The stickyleaf low rabbitbrush and broom snakeweed densities should also be monitored for their possible displacement of the more palatable forage species. Both sum of nested frequency for grasses and forbs has increased since 1989. This indicates an upward trend with high diversity.

TREND ASSESSMENT

soil - stable

browse - stable

herbaceous understory - up

HERBACEOUS TRENDS --

Herd unit 17 , Study no: 15

T y p e	Species	Nested Frequency			Quadrat Frequency			Average Cover % '96
		'83	'89	'96	'83	'89	'96	
G	Agropyron cristatum	a-	b8	b8	-	5	3	.06
G	Agropyron spicatum	a104	a119	b178	42	48	60	6.32
G	Bromus tectorum (a)	-	-	67	-	-	22	.68
G	Festuca ovina	a15	b-	b-	7	-	-	-
G	Melica bulbosa	-	-	4	-	-	2	.06
G	Oryzopsis hymenoides	a19	b46	ab24	11	22	11	.91
G	Poa fendleriana	a103	b172	b198	41	69	69	5.01
G	Poa pratensis	a-	b12	ab5	-	5	2	.06
G	Poa secunda	a-	b30	c60	-	16	27	1.27
G	Stipa comata	3	5	-	1	2	-	-
Total for Grasses		244	392	544	102	167	196	14.40
F	Agoseris glauca	a5	a-	b141	2	-	57	.95
F	Alyssum alyssoides (a)	-	-	105	-	-	38	.18
F	Allium spp.	a9	b70	c31	5	35	16	.08
F	Antennaria spp.	a-	b21	b40	-	10	18	.52
F	Arabis spp.	5	-	-	3	-	-	-
F	Astragalus cibarius	a-	a-	b93	-	-	37	2.68
F	Astragalus convallarius	13	9	3	6	5	3	.01

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover % '96
		'83	'89	'96	'83	'89	'96	
F	Balsamorhiza sagittata	a18	a33	b85	9	18	37	4.46
F	Castilleja linariaefolia	-	3	2	-	1	2	.03
F	Calochortus nuttallii	7	15	13	5	9	6	.03
F	Castilleja spp.	-	-	3	-	-	1	.03
F	Chaenactis douglasii	-	-	1	-	-	1	.03
F	Cirsium spp.	2	-	3	1	-	1	.00
F	Collomia linearis (a)	-	-	30	-	-	17	.11
F	Comandra pallida	24	27	22	10	15	10	.10
F	Collinsia parviflora (a)	-	-	198	-	-	72	.70
F	Crepis acuminata	a-	a4	b95	-	4	43	.84
F	Cryptantha spp.	2	-	-	1	-	-	-
F	Cymopterus longipes	a-	a-	b70	-	-	36	.33
F	Cynoglossum officinale	-	-	3	-	-	1	.00
F	Delphinium bicolor	a-	a-	b41	-	-	18	.11
F	Erigeron pumilus	a-	a6	b23	-	3	10	.07
F	Eriogonum racemosum	25	25	14	12	15	7	.06
F	Eriogonum umbellatum	a74	a80	b143	30	33	58	2.49
F	Galium spp.	-	-	3	-	-	2	.01
F	Hackelia patens	a5	ab16	b20	3	9	10	.07
F	Lactuca pulchella	2	-	-	1	-	-	-
F	Linum lewisii	a3	a3	b21	2	2	11	.22
F	Lomatium triternatum	a-	b24	b17	-	11	9	.04
F	Lupinus sericeus	21	34	43	10	15	19	1.00
F	Machaeranthera canescens	ab11	a22	b3	5	11	1	.00
F	Machaeranthera spp	5	-	-	3	-	-	-
F	Mertensia spp.	a-	a-	b8	-	-	5	.05
F	Orthocarpus spp. (a)	-	-	9	-	-	5	.05
F	Penstemon humilis	-	3	-	-	1	-	-
F	Phlox longifolia	a-	b90	c134	-	47	56	.30
F	Polygonum douglasii (a)	-	-	19	-	-	7	.03
F	Ranunculus testiculatus (a)	-	-	3	-	-	1	.00
F	Senecio multilobatus	a23	b6	ab9	13	3	7	.04
F	Taraxacum officinale	-	-	1	-	-	1	.00
F	Tragopogon dubius	23	23	27	11	15	13	.09
F	Vicia americana minor	-	6	-	-	2	-	-
F	Viola spp.	a-	a-	b103	-	-	42	1.35
Total for Forbs		277	520	1579	132	264	678	17.18

Values with different subscript letters are significantly different at % = 0.10 (annuals excluded)

BROWSE TRENDS --

Herd unit 17 , Study no: 15

T Y P E	Species	Strip Frequency '96	Average Cover % '96
B	Amelanchier alnifolia	41	3.92
B	Artemisia tridentata vaseyana	62	10.25
B	Chrysothamnus viscidiflorus viscidiflorus	81	7.44
B	Gutierrezia sarothrae	10	.34
B	Purshia tridentata	27	5.14
B	Symphoricarpos oreophilus	18	1.90
B	Tetradymia canescens	8	.03
Total for Browse		247	29.05

BASIC COVER --

Herd unit 17 , Study no: 15

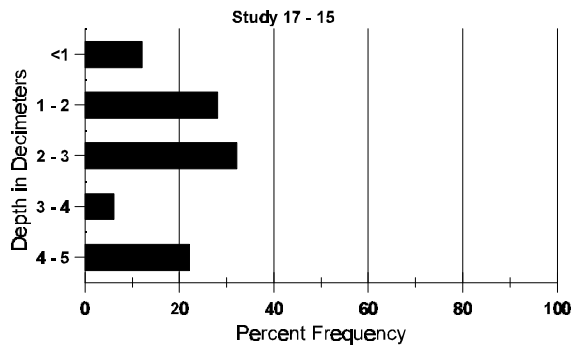
Cover Type	Nested Frequency '96	Average Cover % '83 '89 '96		
Vegetation	381	.50	12.00	54.79
Rock	84	1.00	1.25	1.50
Pavement	123	2.75	17.25	2.71
Litter	400	75.75	58.75	61.57
Cryptogams	31	.75	1.25	.64
Bare Ground	171	19.25	9.50	8.54

SOIL ANALYSIS DATA --

Herd Unit 17, Study no: 15

Effective rooting depth (inches)	Temp °F (depth)	PH	%sand	%silt	%clay	%OM	PPM P	PPM K	dS/m
17.6	50.2 (18.1)	7.6	32.9	33.1	34.0	4.8	12.8	160.0	07

Stoniness Index



PELLET GROUP FREQUENCY --
Herd unit 17 , Study no: 15

Type	Quadrat Frequency '96
Rabbit	5
Elk	19
Deer	35
Cattle	1

BROWSE CHARACTERISTICS --
Herd unit 17 , Study no: 15

AGE	YR	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches)		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4		Ht.	Cr.	
Amelanchier alnifolia																		
S	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	89	1	-	-	2	-	-	-	-	-	3	-	-	-	200		3	
	96	3	-	-	-	-	-	-	-	-	3	-	-	-	60		3	
Y	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	89	4	-	-	2	-	-	1	-	-	5	-	2	-	466		7	
	96	12	-	-	8	-	-	-	-	-	20	-	-	-	400		20	
M	83	1	3	-	-	-	-	-	-	-	3	1	-	-	266	26 18	4	
	89	-	2	1	-	-	-	-	-	-	3	-	-	-	200	47 43	3	
	96	5	9	2	12	6	3	-	-	-	37	-	-	-	740	31 40	37	
D	83	-	3	1	-	-	-	-	-	-	-	2	-	2	266		4	
	89	-	8	3	1	1	-	-	-	-	4	-	6	3	866		13	
	96	1	1	2	-	-	-	-	-	-	4	-	-	-	80		4	
X	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	20		1	
Total Plants/Acre (excluding Dead & Seedlings)															'83	532	Dec:	50%
															'89	1532		57%
															'96	1220		7%

A G E	YR	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Artemisia tridentata vaseyana																		
Y	83	9	-	-	-	-	-	-	-	-	9	-	-	-	600		9	
	89	3	-	-	-	-	-	-	-	-	3	-	-	-	200		3	
	96	1	-	-	1	-	-	-	-	-	2	-	-	-	40		2	
M	83	23	6	-	-	-	-	-	-	-	29	-	-	-	1933	24 26	29	
	89	13	5	-	1	-	-	-	-	-	16	-	3	-	1266	25 30	19	
	96	23	39	7	1	4	-	-	-	-	74	-	-	-	1480	27 43	74	
D	83	2	7	1	-	-	-	-	-	-	10	-	-	-	666		10	
	89	7	9	-	-	-	-	-	-	-	7	1	7	1	1066		16	
	96	8	13	5	-	2	-	-	-	-	18	-	1	9	560		28	
X	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	560		28	
Total Plants/Acre (excluding Dead & Seedlings)														'83	3199	Dec:	21%	
														'89	2532		42%	
														'96	2080		27%	
Chrysothamnus viscidiflorus viscidiflorus																		
S	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	89	1	-	-	-	-	-	-	-	-	1	-	-	-	66		1	
	96	3	-	-	-	-	-	-	-	-	3	-	-	-	60		3	
Y	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	89	2	-	-	-	-	-	-	-	-	1	-	1	-	133		2	
	96	31	-	-	1	-	-	-	-	-	32	-	-	-	640		32	
M	83	61	-	-	-	-	-	-	-	-	61	-	-	-	4066	9 9	61	
	89	51	-	-	4	-	-	1	-	-	52	-	4	-	3733	13 16	56	
	96	246	2	-	23	-	-	-	-	-	271	-	-	-	5420	12 21	271	
D	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	89	9	-	-	-	-	-	-	-	-	7	1	1	-	600		9	
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Total Plants/Acre (excluding Dead & Seedlings)														'83	4066	Dec:	0%	
														'89	4466		13%	
														'96	6060		0%	

A G E	YR	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Gutierrezia sarothrae																		
S	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	96	5	-	-	-	-	-	-	-	-	5	-	-	-	100		5	
Y	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	96	13	-	-	-	-	-	-	-	-	13	-	-	-	260		13	
M	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	96	27	-	-	1	-	-	-	-	-	28	-	-	-	560	8 10	28	
D	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	96	5	-	-	-	-	-	-	-	-	5	-	-	-	100		5	
X	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	60		3	
Total Plants/Acre (excluding Dead & Seedlings)														'83	0	Dec:	0%	
														'89	0		0%	
														'96	920		11%	
Purshia tridentata																		
S	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	89	1	-	-	-	-	-	-	-	-	1	-	-	-	66		1	
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	83	4	-	-	-	-	-	-	-	-	4	-	-	-	266		4	
	89	-	4	-	-	-	-	-	-	-	4	-	-	-	266		4	
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
M	83	1	3	2	-	-	-	-	-	-	6	-	-	-	400	43 54	6	
	89	-	5	-	-	-	-	-	-	-	5	-	-	-	333	38 47	5	
	96	-	2	20	1	1	2	-	-	-	25	1	-	-	520	40 71	26	
D	83	-	4	-	-	-	-	-	-	-	4	-	-	-	266		4	
	89	-	5	1	-	-	-	-	-	-	6	-	-	-	400		6	
	96	-	2	-	-	1	1	-	-	-	1	-	-	3	80		4	
X	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	20		1	
Total Plants/Acre (excluding Dead & Seedlings)														'83	932	Dec:	29%	
														'89	999		40%	
														'96	600		13%	

A G E	YR	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Symphoricarpos oreophilus																		
S	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	89	-	-	-	1	-	-	-	-	-	1	-	-	-	66		1	
	96	-	-	-	1	-	-	-	-	-	1	-	-	-	20		1	
Y	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	96	5	-	-	4	-	-	-	-	-	9	-	-	-	180		9	
M	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	96	5	1	-	13	-	-	-	-	-	19	-	-	-	380	23 29	19	
Total Plants/Acre (excluding Dead & Seedlings)														'83	0	Dec:	-	
														'89	0		-	
														'96	560		-	
Tetradymia canescens																		
Y	83	3	-	-	-	-	-	-	-	-	3	-	-	-	200		3	
	89	2	-	-	-	-	-	-	-	-	2	-	-	-	133		2	
	96	4	-	-	1	-	-	-	-	-	5	-	-	-	100		5	
M	83	3	-	-	-	-	-	-	-	-	3	-	-	-	200	12 12	3	
	89	1	-	-	-	-	-	-	-	-	1	-	-	-	66	6 10	1	
	96	2	-	-	-	1	-	-	-	-	3	-	-	-	60	8 12	3	
D	83	1	-	-	-	-	-	-	-	-	1	-	-	-	66		1	
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Total Plants/Acre (excluding Dead & Seedlings)														'83	466	Dec:	14%	
														'89	199		0%	
														'96	160		0%	